

### DESCRIPTION

The EV5610-QG-00A is an evaluation board for the MP5610. The MP5610 is a dual-output converter for small size LCD panel bias supply.

With the 2.7V-5V input voltage, the EV5610-QG-00A can provide +/-5.4V output voltage with 40mA current capability for LCD. The voltage tracking between positive and negative output is good under variable load condition.

The variety protections are including in EV5610-QG-00A. Output OVP, Output UVP, Input DC Current Limit, Cycle-by-Cycle Current Limit and OTP.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V <sub>IN</sub>	2.7-5	V
Positive Output Voltage	V <sub>+</sub>	5.4	V
Negative Output Voltage	V <sub>-</sub>	-5.4	V
Output Current	I <sub>o</sub>	0-40	mA

### FEATURES

- 2.7V-to-5.5V Input Voltage
- Max. 50mA Output Current for Each Output
- Up to Programmable 5.8V Output Voltage
- 0.5% Line Regulation for Step-up Converter
- 0.5% Load Regulation for Step-up Converter
- 1% Voltage Tracking Between Dual-ch
- 600mV Feedback Voltage with ±1% Accuracy
- 270us Soft Start Time
- Input DC Current Limit Protection
- Output Over Voltage Protection
- Output Under Voltage Protection
- Input UVLO Protection
- Over Temperature Protection
- Available in a QFN-10 (1.4mm×1.8mm) Package

### APPLICATIONS

- Feature Phones and Smart Phones
- Small Size LCD Displays

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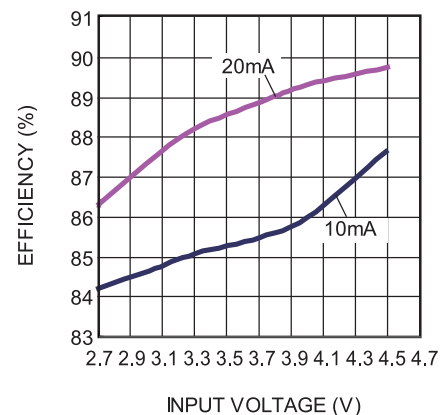
## EV5610-QG-00A EVALUATION BOARD



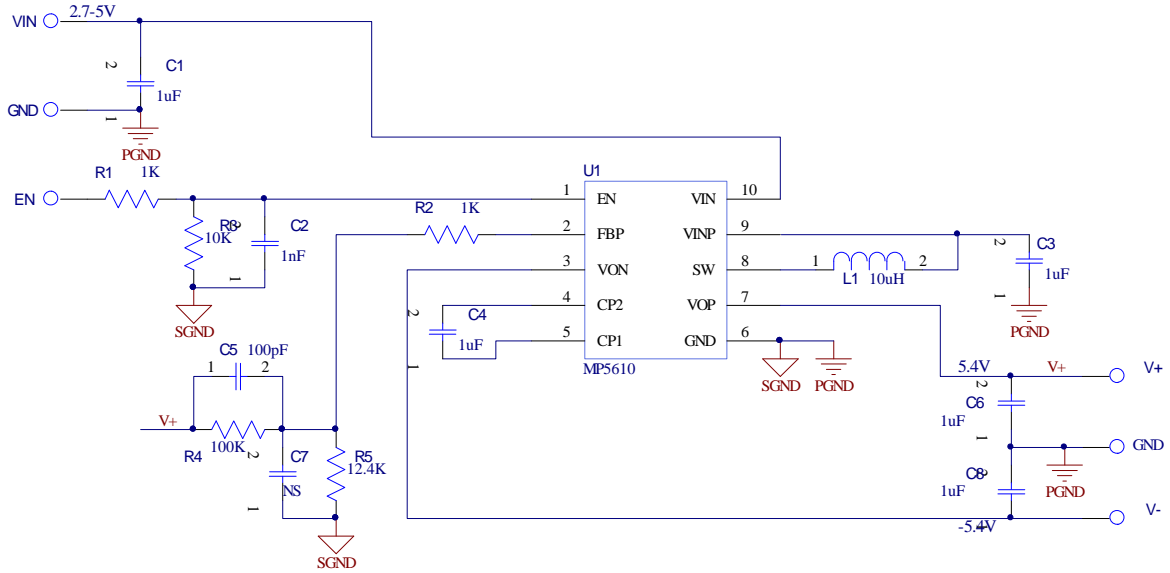
(L x W x H) 5cm x 4.6cm x 3mm

Board Number	MPS IC Number
EV5610-QG-00A	MP5610GQG

Efficiency vs. V<sub>IN</sub>



EVALUATION BOARD SCHEMATIC



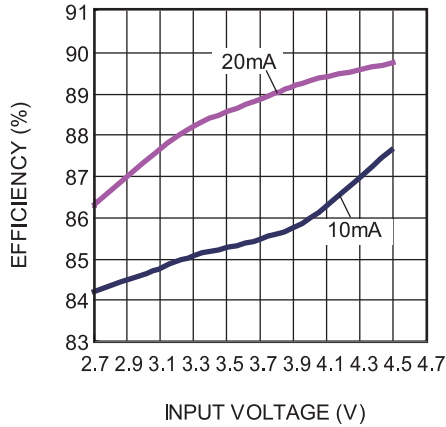
**BILL OF MATERIALS**

Qty	Designator	Value	Description	Package	Manufacture	Manufacture_PN
2	C1, C3	1uF/6.3V	Ceramic Capacitor;6.3V;X7R;0603;	0603	Murata	GRM188R70J105KA01D
1	C2	1nF	Ceramic Capacitor;50V;X7R;0603;	0603	TDK	C1608X7R1H102K
3	C4, C6, C8	1uF/10V	Ceramic Capacitor;10V;X7R;0603	0603	Murata	GRM188R71A105KA61D
1	C5	100pF	Ceramic Capacitor;50V;COG;0603;	0603	TDK	C1608COG1H101J
1	C7	NS				
1	L1	10uH	Inductor;10uH;420m;300mA	3225	TOKO	DFE322512C 1277AS-H-100M
2	R1, R2	1K	Film Resistor;1%	0603	Yageo	RC0603FR-071KL
1	R3	10K	Film Resistor;1%;	0603	Yageo	RC0603FR-0710KL
1	R4	100K	Film Resistor;1%;	0603	Yageo	RC0603FR-07100KL
1	R5	12.4K	Film Resistor;1%;	0603	Yageo	RC0603FR-0712K4L
1	U1	MP5610	Dual-ch LCD Bias	QFN-10	MPS	MP5610GQG

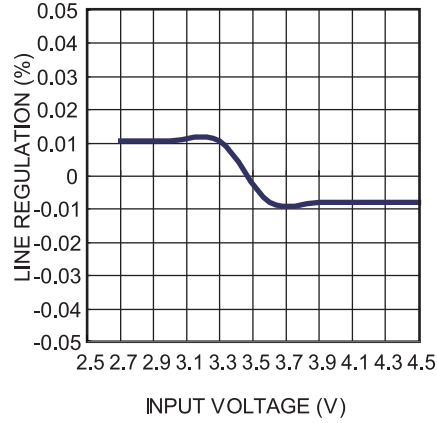
## EVB TEST RESULTS

$V_{IN} = 3.7V$ ,  $V_{+} = 5.4V$ ,  $V_{-} = -5.4V$ ,  $T_A = 25^{\circ}C$ , unless otherwise noted.

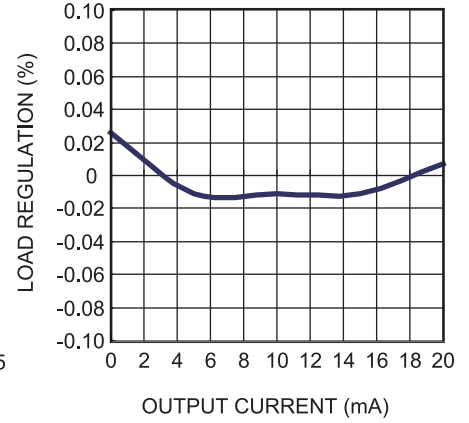
Efficiency vs.  $V_{IN}$



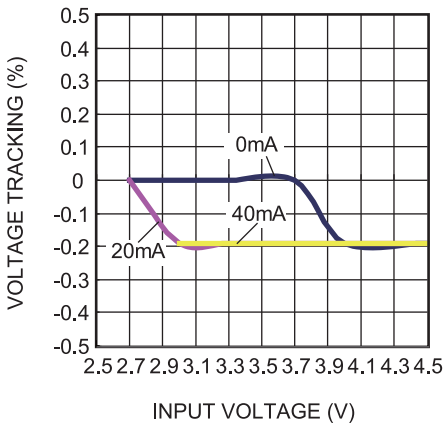
Line Regulation



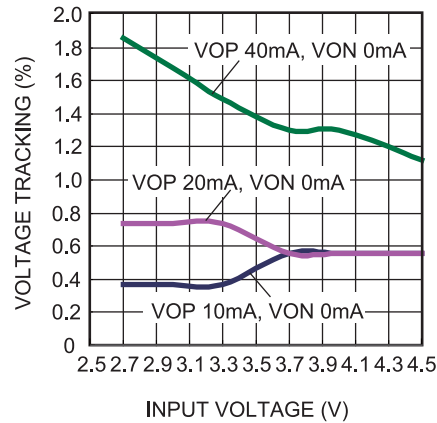
Load Regulation



Voltage Tracking @ Symmetric Load



Voltage Tracking @ Asymmetric Load



**Notes:**

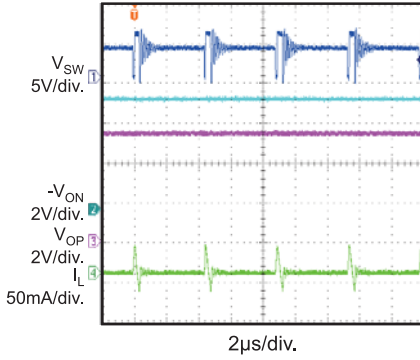
(a) Line/Load Regulation:  $(V_{OP} - V_{OP,AVG}) / V_{OP,AVG} * 100\%$ .

(b) Voltage Tracking:  $(|V_{ON}| - V_{OP}) / V_{OP} * 100\%$ .

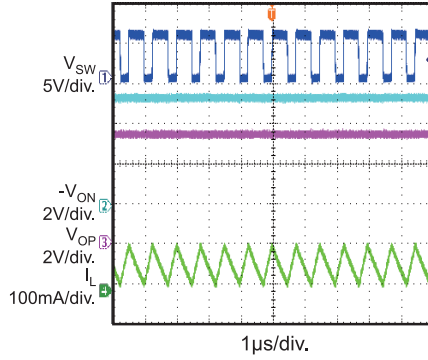
**EVB TEST RESULTS (continued)**

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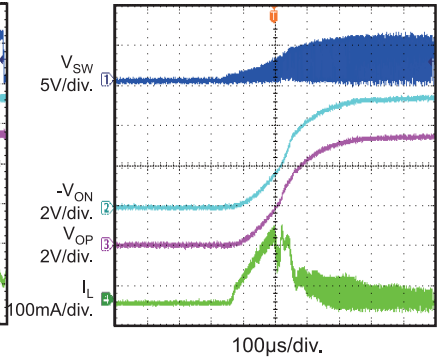
**Steady State @ No Load**



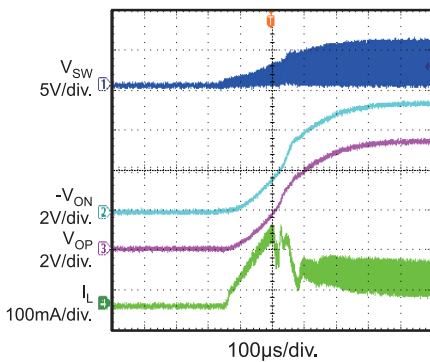
**Steady State @ 20mA Symmetric Load**



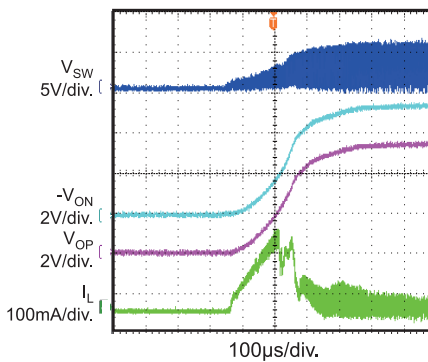
**V<sub>IN</sub> Startup @ No Load**



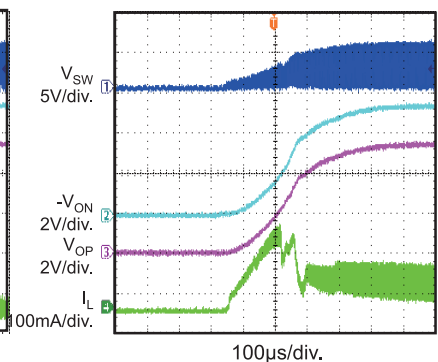
**V<sub>IN</sub> Startup @ 20mA Symmetric Load**



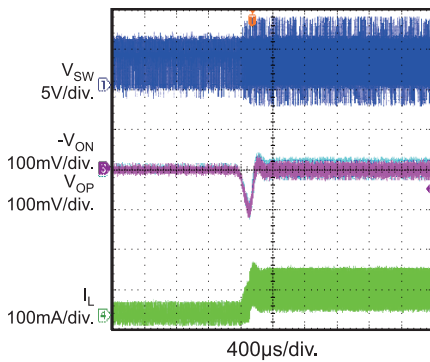
**EN Startup @ No Load**



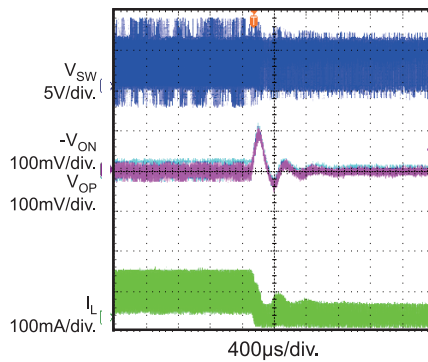
**EN Startup @ 20mA Symmetric Load**



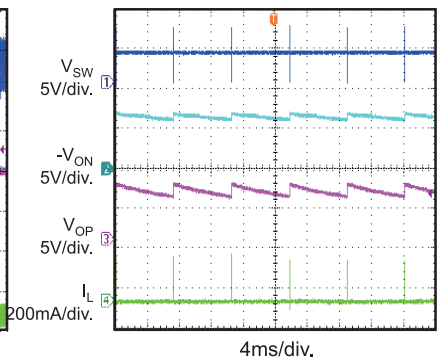
**Load Transient 0->20mA**



**Load Transient 20mA->0mA**

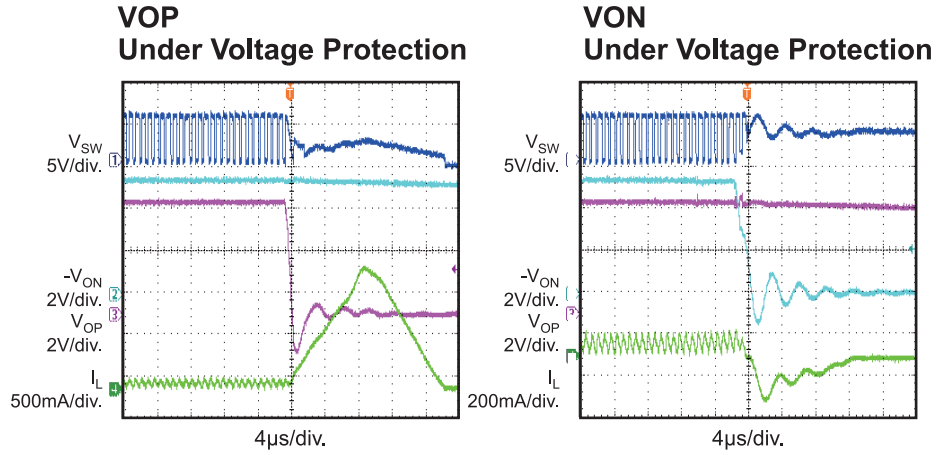


**Over Voltage Protection**

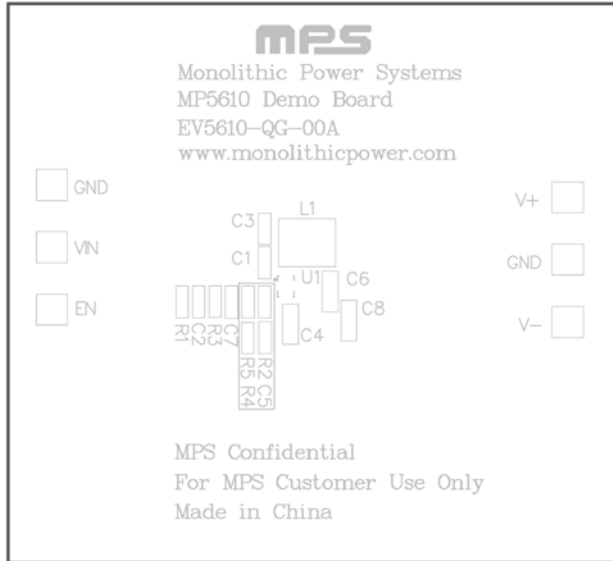


**EVB TEST RESULTS (continued)**

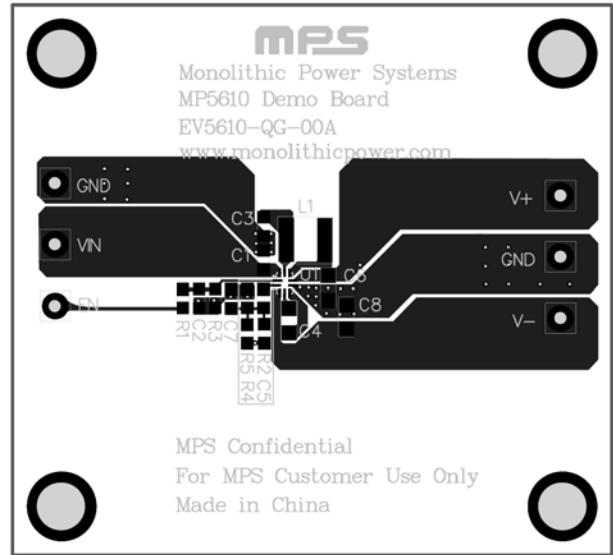
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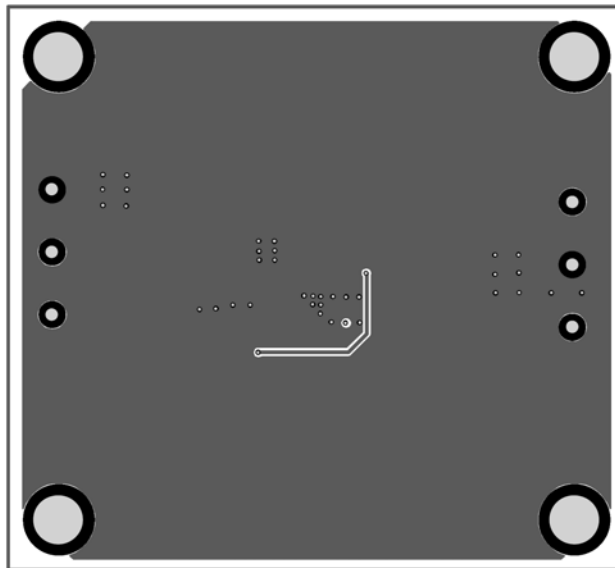
**PRINTED CIRCUIT BOARD LAYOUT**



**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



**Figure 3—Bottom Layer**

## QUICK START GUIDE

1. Connect EVB's output to LCD load, the V+ to LCD's positive node, and the V- to LCD's negative node, and GND to LCD's GND
2. Preset the Power supply's voltage to 2.7V-5V; turn off the power supply, connect the power supply to VIN.
3. Connect a signal with amplitude from 2-5V, connect the signal to EN.
4. Turn on the VIN power supply.
5. Turn on the EN signal, the LCD should be active.

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